YELLOW FEVER IN EIGHTEENTH CENTURY AMERICA*

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THE history of yellow fever, like that of most diseases, is difficult to unravel. During the period under discussion, this fever was not always clearly differentiated from others even in theory, much less in the diagnosis of particular cases. While we may have some assurance that an extratropical epidemic of substantial proportions definitely identified as yellow fever by competent contemporary physicians of 1793 or later may be so labeled today, we must be much more skeptical of sporadic or isolated occurrences and of earlier or second-hand accounts. For example, it has often been said that New York had a yellow fever epidemic in 1668, and possibly it did. However, the universal source for this statement appears to be Noah Webster's *Brief History of Epidemic and Pestilential Diseases*,[1] and his only real evidence seems to have been that the authorities ordered a Fast Day that fall because the city was so sickly. Similarly, as Saul Jarcho has shown, the cases of so-called yellow fever described by John Mitchell of Virginia in 1742, whatever else they may have been, were certainly not yellow fever as we define it.[2] Thus it may be safely asserted that yellow fever was not the cause of all the outbreaks listed by Webster, Hirsch, Toner, Augustin, and Scott.[3]

Although the matter is by no means certain, the weight of recent authority, on the basis of immunological and entomological as well as historical evidence, tends to favor the opinion that yellow fever probably came to the New World from Africa.[4] The paucity of early medical records and the difficulty of retrospective diagnosis make it impossible to say when and where yellow fever first appeared in the Americas, but the earliest epidemic generally accepted as yellow fever occurred in Yucatan in 1648. Almost certainly it was the same epidemic

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that had broken out earlier in Barbados in the fall of 1647. Barbados had been subject to heavy immigration from England for more than a decade, and was already overcrowded with a white population previously unexposed to the disease. In the 1640's, Dutch slavers began introducing large numbers of Negroes from Africa, and presumably they brought the disease. The introduction of slave labor also set the white English immigrants adrift. Many of them turned to buccaneering and helped to spread the epidemic beyond the usual channels of legitimate commerce. During 1648 and 1649 yellow fever also broke out in St. Kitts, Guadeloupe, and Cuba.[5]

Although yellow fever may well have affected other Caribbean communities during the following decades, the next definite epidemic appeared in Brazil in 1685. Five years later, shortly after the outbreak of the War of the League of Augsburg (1689-1697), a French warship en route from Bangkok stopped at Recife, picked up yellow fever, and brought it to Martinique, where it was called the *mal de Siam*. Evidently it had been absent from the Antilles for some time, since it spread through the Caribbean quite extensively during the 1690's with the epidemiological characteristics of a newly introduced disease among a previously unexposed population.[6]

Presumably the disruptions of war helped to disseminate the epidemic through the islands. Certainly the war led to the first definite appearance of yellow fever in the British continental colonies. In 1693 an English fleet under Sir Francis Wheeler sailed for the Caribbean, intending to cooperate with the colonials in Barbados and Antigua in an attack on Martinique. However, sickness among his troops, added to French resistance, forced Wheeler to withdraw. He sailed for Boston, planning now to join the New Englanders in an attack on Canada. By the time he reached Boston, he had lost over half his command, partly, at least, from yellow fever. The Massachusetts governor attempted to isolate the English forces but without success, and during July several deaths occurred among the townspeople. Soon after, Wheeler sailed for England, and in the fall the epidemic disappeared.[7]

The next known outbreaks of yellow fever north of the Caribbean were in 1699, when the disease afflicted both Philadelphia and Charleston, and in 1702, when it probably reached New York. Although present off and on in the West Indies during the next 35 years, it apparently reached no farther north than Charleston, where probable

epidemics occurred in 1706, 1728, and 1732. King George's War (1739-1748) brought a series of epidemics that affected not only Charleston in 1739, 1745, and 1748, but also Philadelphia in 1741 and 1747. Some evidence suggests that yellow fever may also have been present in New York in 1743, 1745, and 1748. The next northward incursion came during the French and Indian War (1754-1763). In 1761 yellow fever was imported into Cuba—for the first time since 1655, according to some authorities—from Vera Cruz. The following year it ravaged British forces besieging Havana and was brought thence to Philadelphia.[8]

Thereafter there were, so far as we know, no further outbreaks in the continental colonies for 30 years. It is true that Hirsch lists an epidemic in New York in 1791, but the contemporary description that he cites suggests typhus rather than yellow fever.[9] Hirsch and others list an epidemic in Charleston in 1792. The origin of this outbreak, if indeed it was yellow fever, deserves further investigation.[10] Apparently this 30-year exemption was due primarily to the absence of the disease from the Lesser Antilles. The British West Indies, in turn, were probably saved by a combination of luck, trade regulations, and the fortunes of war. Too small themselves to support endemic yellow fever, these islands, except possibly Jamaica, were afflicted only when the disease was imported from the Spanish colonies or Africa. Peacetime European colonial policies generally prohibited commercial intercourse between the possessions of different nations, and in the 1760's the British were finally beginning to enforce their navigation laws. During the American Revolution (1775-1783), most of the action in the Caribbean took place in the Lesser Antilles. British operations against the Spanish Main were limited to two minor expeditions against Central America, both staged from Jamaica. Both operations suffered severely from disease, and it is possible that one of these was the source of an epidemic in Jamaica among some newly arrived British regiments in the fall of 1780. Apparently, however, this epidemic did not lead to similar outbreaks in other British and French colonies. Whether yellow fever was otherwise present in Jamaica is not clear.[11]

After the return of peace in 1783, the United States as a newly independent nation found itself exempt from the burdens of the British colonial system, but also excluded from its privileges, including the right to trade with other British colonies. Illicit trade, which was as

necessary for the economic survival of the West Indian planters as it was profitable to the Americans, rapidly grew to substantial proportions, but in this brief period of relative stability yellow fever remained quiescent.

In 1793, however, the Caribbean peace was again shattered by the outbreak of war between England and France in February and by the slave rebellon in St. Domingue (now Haiti) in June. Yellow fever promptly reappeared. This time the spark came from Africa. The year previous a group of English abolitionists had attempted to settle a colony on Bolama, one of the Bissagos Islands off the coast of Portuguese Guinea in West Africa. Shortly after the arrival of these colonists yellow fever appeared. One of the vessels that had brought the settlers, the ship *Hankey*, reached Grenada on February 19, 1793. Sailors from other vessels visited the newcomer, and immediately an epidemic began spreading.[12]

Ships from Grenada in turn rapidly disseminated the epidemic to other British islands. By July 1793 it had reached St. Vincent, Barbados, Tobago, Dominica, Antigua, and St. Kitts as well as the Spanish island of Trinidad. In all these places it affected not only soldiers and sailors from Europe, but also the local inhabitants and French refugees from St. Domingue. A physician who had practiced in Dominica for 24 years reported that never before had he seen a similar pestilence. Many people thought it a "new disease." The one exception was Martinique, where the local French inhabitants generally escaped, though American sailors and British troops suffered severely. Clearly yellow fever had been absent from the rest of the Lesser Antilles for many years.[13] Indeed, William Currie specifically stated that yellow fever had seldom been epidemic in the West Indies except in time of war, and that no trace of the disease could be found in the islands from the end of the Revolution until 1793.[14] For the next decade, however, until Napoleon at last gave up his American ambitions and sold off Louisiana to the United States, thousands of European sailors and soldiers in crowded ships and barracks, and hundreds of American merchantmen seeking the profits of neutral trade, were continually pouring into the West Indies. This constant influx of susceptible men, the unsettled social conditions, and the extensive unregulated commerce among the islands, provided an ideal setting for yellow fever. Throughout this decade the West Indies provided an active reservoir of yellow

fever in frequent commercial contact with the seaports of the United States.

The first northern incursion of the "fever of Bolama" initiated Philadelphia's famous epidemic of 1793, which has been described many times over in medical and popular literature.[15] Philadelphia alone was affected in 1793, but from 1794 through 1805 yellow fever broke out repeatedly in Boston, New York, Philadelphia, Baltimore, Norfolk, and Charleston, and less frequently in smaller towns such as Portsmouth, Newburyport, Providence, New London, New Haven, Wilmington, Del., and Wilmington, N. C.[16] Thereafter the disease virtually disappeared from northern seaports until 1819.

In reviewing this record, two points should be obvious. First, yellow fever was not endemic in the West Indies during the 18th century and did not supply a constant reservoir of infection. Rather, the area was subjected to periodic reinfections from Africa or the Spanish continental colonies, and only then became a source of danger to the eastern seaboard. Second, the epidemics were associated with wars, which brought large numbers of previously unexposed soldiers and sailors from Europe to the Caribbean under conditions ideal for the dissemination of yellow fever; these conflicts also broke down the normal barriers to contact between the colonies of different nations. These points serve to remind us again of the importance of political and economic factors in governing the course of disease.

In 1793, as news of Philadelphia's distress spread up and down the coast, citizens and governments alike had assumed that the disease was contagious—just as the Massachusetts government had in 1648—and instituted rigorous protective measures to keep out refugees who might be carrying the infection.[17] With each succeeding summer of pestilence, the public demanded still stronger action. At first the emphasis was on quarantine, as in 1793, but with experience and study an increasing number of physicians began doubting the value of quarantine. The result was a vigorous dispute within the profession as to whether yellow fever was contagious and imported or the spontaneous product of local circumstances.

The arguments on each side have been ably analyzed by Charles Winslow and others, and there is no need to repeat them here in detail.[18] In brief, the contagionists maintained that the symptoms, progress, and mortality of the yellow fever of the northern seaports proved its

identity with the yellow fever of the West Indies and clearly distinguished it from the regular autumnal bilious and remittent fevers (chiefly typhoid and malaria) of local miasmatic origin. Despite ever-present sources of noxious exhalations, yellow fever occurred only occasionally. The outbreaks invariably began in seaports and had regularly been traced to the vicinity of infected vessels, persons, clothes, or bedding coming from the West Indies. Many contagionists admitted that yellow fever was communicated more readily in an impure atmosphere than in the fresh air of the countryside, and they advocated sanitary improvements to eliminate putrid exhalations. But they denied that the disease was ever generated in the United States, and they urged a vigilant quarantine as the most important defense.[19]

Anticontagionists such as Benjamin Rush and Noah Webster, on the other hand, argued that filthy waterfronts were natural places for epidemics to start. The disease appeared only in those climates, seasons, and places in which heat, acting on moist animal and vegetable matter, produced putrid exhalations. The anticontagionists pointed to the similarity or alleged identity between the symptoms of yellow fever and those of the common bilious, remittent, and intermittent fevers (which nearly every physician believed arose from marsh miasmata), and they noted that all these fevers were alike destroyed by long-continued and heavy rains, by frost, or by intense heat and high winds. The greater malignancy of yellow fever they attributed to a particularly unfavorable epidemic constitution. Most important of all, repeated observations showed that healthy persons who went into a locality where the sickness prevailed often became ill without ever having been in contact with a patient, while persons stricken with the disease who left the area where they contracted it hardly ever communicated it to others. The anticontagionists therefore opposed maritime quarantine and recommended instead extensive sanitary measures, including sewer construction, waste removal, broad streets planted with trees, numerous open squares, large house lots, and an end to overcrowding—in short, comprehensive city planning, sanitation, and housing reform.[20]

In the face of these conflicting medical opinions municipal and state authorities strengthened existing regulations and instituted new measures based on the possibility that either view might be correct. The Pennsylvania legislature, for example, tightened the quarantine system and

provided for a board of health in 1794. During the next few years it passed several more acts directed against yellow fever, and in 1799, largely as a result of the recent epidemics, Philadelphia began work on a public water supply. Baltimore appointed a seven-man health committee in 1794 which adopted quarantine regulations the following year; in 1797 new health ordinances placed sanitary administration under the city commissioner and established a Board of Health to superintend quarantine. New York enacted a series of increasingly stringent quarantine laws, created a three-man Health Office Commission to administer them, and authorized the Common Council to pass sanitary ordinances, abate nuisances, and appoint a sanitary inspector. In 1797 the Massachusetts General Court authorized towns throughout the Commonwealth to appoint health officers or health committees. Two years later the legislature established a 12-man Board of Health in Boston, which proceeded to adopt both sanitary and quarantine regulations for protection against the disease.[21]

After 1805, yellow fever virtually disappeared from northern seaports for a number of years. As the danger seemed less immediate, medical writers turned to other subjects and health administration became routine. But then a succession of epidemics from 1819 through 1822, in Boston, New York, Philadelphia, and Baltimore disrupted the truce between the two medical factions. A new series of polemics rehearsed the familiar arguments between the contagionists and their old opponents.

The primary center of contagionist thought was New York, where David Hosack continued to urge the importance of rigid quarantine laws, and the city in fact maintained a stringent quarantine against yellow fever in subsequent years.[22] Elsewhere the great majority of physicians were by this time anticontagionist and antiquarantine.[23] In Baltimore, where anticontagionism started early and was strong, the government had virtually abolished the quarantine system in 1808. Even after the epidemic of 1819, which was centered near the docks, the authorities for years prided themselves on never quarantining other cities because of yellow fever. In Philadelphia the quarantine laws remained on the books, but an ardent anticontagionist was elected president of the Board of Health in 1820, and he stemmed the epidemic that year by removing everyone from the infected area, in accordance with localist principles. In Boston the Board of Health, under attack

for its quarantine procedures, was abolished by a new city government, which then proceeded to relax the quarantine regulations in conformity with anticontagionist ideas.[24]

Today we may note that the contagionists were right in that the yellow fever of northern seaports was imported from the West Indies and quarantine was a logical means of protection. On the other hand, the anticontagionists were right in attributing its spread to some local influence (namely, *Aëdes aegypti*), although none of the sanitary measures they recommended—except the introduction of piped water supplies, which make domestic storage of water unnecessary—would have been of significant value against yellow fever. Moreover, the anticontagionists did adopt the best method available at the time for stopping an epidemic once it had started, which was to remove everyone from the infected locality until the first frost. Both theories were partly right and partly wrong; each was the basis for partly successful applications.

Since the two theories may appear to us to have been so evenly matched in the light of contemporary evidence, it is interesting to speculate on why the great majority of physicians and public health officials by the 1820's ranged themselves on the anticontagionist side. Referring to the similar but somewhat later controversy in Europe, Erwin H. Ackerknecht has argued that nonmedical influences were at work. In his Garrison Lecture of 1948 on "Anticontagionism Between 1821 and 1867," Dr. Ackerknecht declares:

> I am afraid that, forced to decide ourselves a hundred years ago on the basis of the existing materials, we would have had a very hard time. *Intellectually and rationally the two theories balanced each other too evenly. Under such conditions the accident of personal experience and temperament, and especially economic outlook and political loyalties will determine the decision. These, being liberal and bourgeois in the majority of the physicians of the time brought about the victory of anticontagionism.*[25]

In the Europe of the 1820's, 1830's, and 1840's, anticontagionism, which tended toward the elimination of quarantines with their attendant bureaucracies and restrictions on commerce, may well have been on the side of political and economic liberalism. But was this true in America? Politically and economically the United States was already the most liberal nation in the world. There was no landed aristocracy

or semihereditary class of civil servants to oppose the advance of the middle class, and I can find no correlation between anticontagionism and politics in America. On the other hand, it is apparent that the side superficially at least more favorable to commerce won. Was this victory determined, consciously or unconsciously, by economic motivation and pressures?

The anticontagionists here, like their European counterparts later, did point out forthrightly the economic inducement for ending yellow fever quarantines. In a typical appeal, David M. Reese of Baltimore emphasized the injuries caused by quarantine to commercial interests. But he also invoked a brash and blatant patriotism characteristic of the young, uncertain nation. The United States, in Reese's view, had been too dependent upon European ideas. "We have not sufficiently *maintained* our independence," he wrote, "which is equally important as its *Declaration.*" We should heed our own authors instead of foreign scribblers. "The cause of science, of philosophy, of humanity, of truth," he proclaimed, "all are interested in the extermination of this relic of ignorance and superstition." With the abolition of quarantine, wrote Reese:

> Liberty will supplant tyranny and oppression, light shall disperse darkness, Science shall dissipate the mists of error, and Philosophy shall exterminate ignorance and superstition forever. This country, yet in its infancy, will be the criterion of philosophical truth, and the theatre of successful scientific research. Europe shall lose the epithet of being the "mother of Philosophy," Science shall flourish under the wings of our Eagle with unsullied splendor, and we shall yet soar above all French, above all British fame.[26]

According to Benjamin Rush, quarantine laws were worse than useless. Not only had the nation's economy suffered: "Thousands of lives have been sacrificed, by that faith in their efficacy, which has led to the neglect of domestic cleanliness." Worse yet, belief in the contagiousness of yellow fever, which the quarantine laws encouraged, had "extinguished friendship, annihilated religion, and violated the sacraments of nature, by resisting even the loud and vehement cries of filial and parental blood." [27]

As these and other appeals that might be quoted suggest, the anticontagionists were using the commercial argument along with patriotism, liberty, science, religion, and motherhood to gain support for

doctrines based in the first instance on strictly medical grounds. In their minds the adverse effects of quarantine on commerce were of minor significance compared to the alleged fact that current quarantine practices, by holding ships in the hot sun and fostering putrefaction, and by making the need for sanitary reform seem less urgent, were not merely useless, but actually harmful to the public health.

Moreover, the economic argument, like the medical, can be worked both ways. For example, William Currie, a convinced contagionist, wrote that belief in the domestic origin of yellow fever would cause foreign commerce to shun American ports and lead to their depopulation, "for few that deserve the name of rational beings, would be found so prodigal of health and life, however powerful their love of gain, as to immigrate to, or venture to reside in the seat of pestilence and death."[28]

More important is the fact that the implications of the localist theory were even more far-reaching for real estate interests than those of the contagionist theory were for commercial. Pleading the cause of the landlord has rarely had great popular success, and it is perhaps not surprising that arguments based on the landed interest figure less prominently in the public debate than those based on the commercial. It was in fact used most tellingly by the anticontagionists, who charged their opponents with a selfish desire to protect the value of their tenements.

Other facts also suggest that commercial considerations were not decisive, however useful they may have been to medical polemicists. As long as any substantial segment of medical opinion supported contagionist views, cities maintained their quarantines, whatever the effect on commerce. In Boston the Board of Health maintained a rigid quarantine until 1824, in defiance of medical opinion. This was not because the members were bureaucrats afraid of losing good jobs: they were ordinary citizens elected for a single year by their fellow townsmen and serving entirely without pay. Nor was it because the members were insensitive to the commercial implications of their stand: most of them were businessmen, and Boston's leading business was maritime commerce. Merchants were well aware that the losses involved in holding ships on quarantine were far less than those resulting from a single epidemic, even without counting the loss of life. So long as the possibility of importing the disease existed, it was safer, from a purely economic viewpoint, to maintain a careful guard. On the other hand,

once the doctors had quite generally agreed on the localist theory and quarantines were accordingly relaxed, cities were not, as Rush, Webster, and others had recommended, reconstructed for health.[29]

The course of events demonstrates that the economic pressures against contagionism and quarantine were not nearly so potent as the economic pressures against anticontagionism and sanitary reform. The bureaucracy and expense of quarantine were minor indeed compared to the bureaucracy and expense of adequate sewerage, housing, and municipal cleanliness. In fact this country is still unwilling to pay the cost of a sanitary environment. I believe it may be safely said that independent medical opinions reached objectively, rather than the needs of commerce or political sentiments, caused the overthrow of contagionism with respect to yellow fever in America.

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25. *Bull. Hist. Med. 22:*589, 1948.
26. Reese, D. M. *Observations on the Epidemic of 1819, as It Prevailed in a Part of the City of Baltimore.* Baltimore, author, 1819, pp. 83-91.
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28. Currie, *Sketch* (note 14), pp. 76-77.
29. The difficulty of interfering with real estate rights for the sake of the public health was noted by David Ramsay in his lament over lost opportunities for proper planning and legal controls—zoning in 20th century terms—in laying out the new capital of South Carolina. See his *History* (note 10), vol. 2, pp. 103-05.